Identifying Dropout and Absenteeism Risk Using a Validated Measure in an Adolescent Mentorship Program

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**Abstract**

Adolescence serves as a crucial transitioning point into adulthood. Therefore, it is important that these transitioning adolescents are provided quality mentorship from college students as they make this important transition. Campus Connections, an evidence-based at-risk adolescent mentoring program, provides this support. However, Campus Connections experiences adolescent dropout and lowered rates of attendance from adolescents with negative risk factors.This study uses logistic and Poisson regression to build a predictive model for adolescent program dropout. Overall, internal, and external risk factors reported from adolescent caretakers are used as the main predictors of program dropout an attendance rate. Overall and internal risk factors were the most predictive of program dropout and attendance rate throughout the course of the program. External risk factors appeared to be less predictive of the outcome variables across both models. Implications for intervention based on scores on the validated risk measure may help to reduce program dropout of adolescents in both Campus Connections and other programs working with adolescent populations. Furthermore, reducing dropout and absenteeism allow adolescent populations to experience the full effects of mentorship support in order to produce better outcomes as they make the transition into adulthood.

*Keywords:* dropout, absenteeism, mentorship, at-risk, adolescents

**Introduction**

Quality mentorship plays a powerful role in positively affecting an individual’s personal, academic, and professional situation. The transition from adolescence into adulthood can be a difficult one due to mental health issues and environmental influences. Amongst adolescents with negative risk factors, a strong mentorship program creates an opportunity to promote an everlasting positive change.

Building strong connections with nonparental adults can be a key resource in helping adolescents transition into adulthood (Erdem et al., 2016). These connections are of particular importance to at-risk adolescents. Although at-risk status varies on definition, it generally includes demographic features, home and community factors, and individual skill deficits which can negatively contribute to an individual’s ability to thrive academically, socially, emotionally, and physically (Mcdaniel & Yarbrough, 2016). These behaviors can often escalate into more serious behavior and subsequent consequences such as incarceration (Mcdaniel & Yarbrough, 2016). Given these considerations and outcomes, preventive efforts are needed to reduce levels of emotional stress and minimize behavioral difficulties amongst at-risk youth. Mentoring programs are one such effort. Analyses of quasi-mentorship programs and experimental programs support mentorship programs as a pathway to reduce emotional symptoms and behavioral problems amongst at risk youth (Erdem et al., 2016). Two common mentorship programs are community and school based; each has similar foundations with different embedded components and applications. Research has found that community based mentorships tend to form stronger relationships than school based programs. This is typically attributed to increased dosage or length of time spent together and appropriate matching based on relevant common characteristics between mentor and mentee. (Mcdaniel & Yarbrough, 2016). However, positives to academic mentoring programs include cost effectiveness, direct improvement of teacher-student relationships, ad improved perceptions of school (SOURCE?). Regardless of the base of the program, the development of a positive relationship between an at-risk youth and a positive caring mentor can promote resiliency, enrichment, and social skills (Mcdaniel & Yarbrough, 2016).

Although the positive benefits of youth mentorship are widely accepted, continual evaluation of the effectiveness of mentorship programs should be taken. Findings obtained when evaluating these types of programs have indicated instances where some youth experience negative impacts and other situations where the reported beneficial outcomes couldn’t be replicated (DuBois et al, 2011).

An additional concern surrounding mentorship programs focuses around attrition rate. Research suggests a level of dosage needed to achieve the full benefits of mentorship (Erdem et al, 2016). Additionally, Erdem et al. (2016) found support for mediating role of mentorship program effects on parental relationships and confidence, but only for youth in matched relationships of 12 months or longer. Unfortunately, negative risk factors can contribute to poor attrition(SOURCE?). While there has been plenty of research regarding dropout rates in school settings (Bowers & Sprott, 2012) and other community social programs (Brorson et al, 2013) there is limited data relating to retention and dropout rates amongst mentorship programs. If risk factors could be identified prior to an individual beginning a mentorship program, then it could be possible to design an intervention which mitigates those negative risk factors, promote continual participation and completion of a program. For instance, past educational programs have used predictions of dropout to intervene and improve retention by up to 40% (Halwawa, Greene, & Mitchell, 2014). The ability to promote program retention leads to the development of stronger and more successful social programs focused on the adolescent population.

Many adolescents enter mentorship programs with negative risk factors; risk factors may include: low socioeconomic status, substance use, academic disadvantages, or a problematic home life. These factors often contribute to higher attrition rates and higher dropout rates of adolescents from school and mentorship programs. A literature review performed by Bowers and Sprott (2012) identified four typologies of students who are at risk for dropping out of school; These include: 1) those chronically struggling with academics, 2) those bored with the process, 3) students who disrupt school, and 4) the quiet students, those who are termed to be living invisibly and dis-attached to the institution and typically carrying low grades. Often, at-risk individuals can fall into one or two of these categories.

Past research has focused on the role mentor exposure has on positive youth outcomes (Erdem et al, 2016). Therefore, it would be beneficial for a program to identify at-risk individuals prior to the start of a mentorship program to cater the program to an individual’s needs. An unfortunate reality is that identifying the adolescent participants most likely to contribute to program attrition has its challenges. Several past research studies have creative predictive models to assess drop out based on demographic risk factors (Gleason & Dynarski, 2002; Halwawa, Greene, & Mitchell, 2014; Levin et al, 2004). However, the use of a valid scale to assess at-risk youth has not yet been utilized. Therefore, the validated measure utilized for this study was the *Risk Assessment* measure; Developed by Herrera, Dubois, & Grossman (2013), this serves as a great measure to understand how at risk an adolescent is. This measure uses care-taker reported responses to create a quantitative score for internal and external risk factors within an adolescent being taken care of by the caretaker. This validated measure assesses and quantifies risk factors that adolescents are experiencing, at home and in life into a more understandable single composite score. Additionally, it incorporates subscales to indicate differences between internal and external subscales.

This study uses Campus Connections, an at-risk adolescent mentorship program at Colorado State University (CSU) as its platform. Campus Connections (CC) is a service learning class offered to students at CSU. Students attending CSU from over 65 different majors volunteer for CC and receive course credit for mentoring an at-risk adolescent within the community. The program supplies at-risk adolescents with a positive mentor for 12 weeks in order to promote positive outcomes as the adolescents make the transition into adulthood and functions as a university-community partnership. Mentees range in age from 11-18 and come from community partnerships such as: The juvenile justice system of Larimer county, local schools, community agencies, and directly from families. Campus Connections serves as a unique platform to perform research because it is an evidence-based social program (Weiler et al, 2014; Weiler et al, 2015).

The focus of this study was to identify and create a quantified method to assess adolescent participants that are likely to contribute to program attrition within the Campus Connections program. It was hypothesized that after controlling for important variables, higher scores on the validated Risk Assessment score would accurately predict adolescents’ probability of dropping out of the Campus Connections program. It was also hypothesized that this score would predict mentee participant’s attendance. Additionally, internal and external risk factors will even more accurately predict the program attendance and dropout. Using this measure, we built a predictive model to assess the association between the *Risk Assessment* overall composite score, internal risk score and external risk score to the likelihood of participant dropout and absenteeism.

**Methods**

*Participants*

Mentee Participants from this study were taken from four semesters of CC 12-week program. Within each semester of CC there is one session for four nights of the week (Monday, Tuesday, Wednesday and Thursday). A total of 458 mentee participants started the Campus Connections program from the Fall of 2015 to Spring of 2017. Key demographic characteristics of the mentee participants are listed in *Table 1.* As can be seen in *Table 1* most adolescent mentees come from households with a parent-reported income of $39,999 or less (54.25%). Additionally, most adolescents in the program self-reported as White (58.26%), with 27.01% self-reporting as Hispanic.

*Program Dropout & Attendance*

Dropout from the program was defined as individuals that agreed to start the program, attended at least one session of the Campus Connections program, but proceeded to either lose contact with the program staff or formally drop out of the program. For instances in which an adolescent mentee participant did not attend the CC program, efforts were made by program staff to contact the adolescent participant’s families. This was conducted mainly by contacting the adolescent’s primary caregivers. Instances in which there was no contact with the mentee’s family after 2 weeks or more, the youth was considered a dropout. Of the 458 mentees that started the CC program, a total of 45 dropped out and did not progress throughout the course of the entire program.

Additionally, program attendance data was collected throughout the mentees 12 weeks. Data was recorded from CC program staff on night of expected attendance. The average attendance of mentees attending the program was 9 days (SD = 3). However, the program attendance ranges from 1 day of attendance to the completed total 12 days of attendance.

*Risk Measure*

To assess mentee risk, the *Risk Screening Tool* (RST) developed by Herrera, Dubois, & Grossman(2013) was used to understand youth risk. The RST is a 32 item questionnaire that youth mentee caretakers would fill out prior to the start of Campus Connections (α = .70). Items in the RST are answered as either “Yes” or “No” and ask questions referring to their child (I.e. *This child has experimented with drugs or alcohol*) or the child’s environment (I.e. *This child lives in a public housing development*). All items answered as “Yes” within the RST contribute to the youth’s Risk score, in which a higher score indicates a larger number of risk factors. Additionally, the there are two additional scales within the measure that contribute to Internal (I.e. This child often says he/she feels alone, sad, upset, cries a lot or is unhappy) and External (I.e. One or more members of this child’s family struggles with alcohol or drug use) Risk factors. A complete listing of the items subscale can be seen in Appendix A.

*Statistical Procedures*

All descriptive statistics and analytic procedures were performed using *SAS Version 9.4* (SAS Institute, 2013).

*Dropout statistical procedures*

A multiple variable logistic regression model was performed to assess program the probability of program dropout (dropped = 1) with the main predictor of the overall, internal, and external risk scores. This research study controlled for many important variables including, mentee gender, mentee age, parental income, mentee ethnicity Demographic descriptive statistics are available in Table 1. Additionally, Semester of attendance (Fall 2015, Spring 2016, Fall 2016, and Spring 2017) night of attendance (Monday, Tuesday, Wednesday, and Thursday) and class room of weekly attendance (two possible rooms) were controlled for to account for cohort and group differences.

Data from this study was collected over 2 years and 4 semesters of Campus Connections. Families of youth that did not attend Campus Connections were attempted to be contacted via program staff. If the family indicated the youth was dropping out of the program, reasons were noted. However, if family of the youth mentee could not be contacted, after 2-3 weeks of no attendance within the program, the youth mentee was considered to have dropped out of the program. Only youth mentees that dropped out of the program *after* the program started are included within this analysis. To assess some nights during the semester having no dropouts, logistic regression results were obtained using PROC GLIMMIX with a binary distribution.

*Attendance statistical procedures*

Campus Connections program staff tentatively took attendance records for each week of the 12-week Campus Connections program. Instances in which youth did not arrive to Campus Connections were marked as non-attendees. If youth arrived, but were late, they were marked having attended the program according to the use of this study. A Poisson regression analysis was used to assess the outcome of attendance day counts (max attendance count= 12) with the predictor of the overall, internal, and external risk scores. The model was additionally run using a negative binomial distribution, no significant changes in the results were found; Therefore, a standard Poisson regression procedure through PROC GENMOD was used to obtain Poisson regression results. Additionally, all the same control variables were used in the Poisson models as the Logistic regression models.

**Results**

*Dropout*

Results from the logistic regression models for Overall, internal, and external risk are shown in *Table 2*.

Model 1 indicates that for every additional unit increase in the score on the parent reported Risk measure there is a 4.4% increase in probability of youth dropping out 95% CI [1.5, 7.2]. Further evidence from models 2 & 3 from *Table 2* show that the Internal Risk factors seem to be a better predictor of program dropout as opposed to external risk factors while controlling for the same variables. Additionally, across all models age serves as a significant predictor of program dropout as well. In general, the older a mentee participant is, the more likely they are to dropout from the program.

*Attendance*

Results from the Poisson regression models for Overall, internal, and external risk are shown in *Table 3*.

Results from the Poisson regression models predicting rate of program attendance yield similar results to the logistic regression models. As expected, overall risk serves as a significant predictor of program attendance. As the overall risk composite score increases, an increased risk of being absent can be seen. Again, similar to the results from the logistic regression procedure conducted in *Table 2* internal risk appears to be a better predictor of program attendance across the 12-week span of the program. Lastly, age serves as a significant predictor of program attendance across all models, with an increase in age indicating a lower rate of program attendance.

**Discussion**

Results support the overall risk composite score show indication that the Risk measure is serves as an effective predictor of youth dropout in the Campus Connections program. Additionally, it appears the overall score is related to higher rates in absenteeism across the 12 weeks. However, when looking at the internal and external risk factors as separate scales, internal risk factors appear to be a more effective measure of predicting dropout and lack of attendance. Therefore, the results align with the study hypotheses except for the results regarding externalized risk factors. Age also appears to serve as a significant predictor in five out of six of the models, thus indicating the relationship of age and likelihood of participating in the Campus Connections program.

Results on Internal risk factors are consistent with past research relating to at-risk youth and dropout in social programs (Borowsky, Taliaferro, & McMorris, 2013; Daniel et al, 2006). Overall, caretaker-reported internal conflicts are associated with risk of being absent from the CC program or are more likely to have a higher rate of absenteeism throughout the course of the 12-weeks. These results give indication that reasons for dropping out or a lower attendance rate may be because the adolescent has too many extraneous circumstances in their own life, thus not preventing them from wanting to attend CC.

However, past research is not consistent with the current research study, the role of external risk factors in the risk of high school dropout (Suh & Suh, 2007). Therefore, these results are inconsistent with past research. Inconsistencies may be attributed to the caretaker-reports of external risk factors. Although these external risk factors often relate to negative youth outcomes overall according to past research studies (Case, 2016; Chen & Jacobson, 2016), a meta-analytic review performed by Assink and colleagues (2015) found smaller effect sizes for interventions focused on delinquent youth familial risk factors. Similarly, the effects from the externalized risk factors related to characteristics of the household don’t influence the family’s motivation to provide adolescent participation in the program.

As discussed by Erdem et al. (2016), mentorship plays an important part in its effects towards experiencing a mentor relationship and ultimately developing positive youth outcomes. Additionally, the importance of at-risk adolescents participating in a program to experience its full effects cannot be emphasized enough. Results relate directly with views posed by Rhodes (2005), in which mentors have the capabilities to challenge negative views mentees have on themselves. As results from the current study help to point out, these negative views and internal risk factors are predictive of not coming to the program – Thus making these mentees the most likely to benefit from the program.

*Strengths and Limitations*

Limitations posed by this study include the caretaker report of adolescent risk. However, the Risk measurement has been heavily validated and has relatively good internal reliability as reported by Herrera, Dubois, & Grossman(2013). Additionally, this study only included individuals that began the program. It is possible that individuals that never began the program are characteristically different than those that were initially had the added effect of at least one session of the program. Of course, efforts aimed at keeping individuals within the CC program may be more efficient and beneficial as program staff have an extended opportunity to be proactive with these youth as they use the Risk measure to intervene and directly during the program hours.

Although limitations exist, the study has several strengths. For instance, this study has the benefit of having a heavily controlled program with a relatively large sample to understand hone in closer to true effects of the parameters associated with program dropout. Additionally, it provides multiple predictive models that go beyond looking at dropout or absenteeism in a singular fashion. Results provide additional resources for program staff in the Campus Connections program.

*Future Studies & Implications*

Future research should apply the Risk measure to other programs focused on at-risk adolescent populations. By performing similar research on multiple communities, it will be possible to observe the generalizability of the measure to predict dropout across multiple communities. Additionally, a comparison of caretaker report and youth report of internal and external risk symptoms would serve as a beneficial tool to understand the effectiveness of these tools in predicting program dropout.

Therefore, the implications of these results will be used to design interventions around composite and internal risk scores on the Risk measure for the Campus Connections program. The use of predictive models to help with participant dropout has already been used in other programs focused to prevent dropout in other programs (Gleason & Dynarski 2002; Halawa, Greene, & Mitchell, 2014). Similar to other programs, these results may serve as generalizable to other at-risk youth mentoring programs and programs serving adolescent populations. By encouraging at-risk adolescents to have continued participation in focused on providing support, then the communities may see a positive impact overall.

**Compliance with Ethical Standards**

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The authors claim no conflict of interests.

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*Table 1*: Descriptive Statistics of Campus Connections Youth Participants

| ***Household Income*** | *Frequency* | *Percent* |
| --- | --- | --- |
| *<$20,000* | 98 | 21.88 |
| *$20,000 to $39,999* | 145 | 32.37 |
| *$40,000 to $59,999* | 81 | 18.08 |
| *$60,000 to $79,999* | 51 | 11.38 |
| *$80,000 to $99,999* | 23 | 5.13 |
| *$100,000 or more* | 50 | 11.16 |
| ***Ethnicity*** | *Frequency* | *Percent* |
| *White* | 261 | 58.26 |
| *Hispanic* | 121 | 27.01 |
| *Other* | 66 | 14.73 |
| ***Gender*** | *Frequency* | *Percent* |
| *Male* | 255 | 56.92 |
| *Female* | 193 | 42.86 |
| ***Age*** | Mean | SD |
|  | 14.33 | 1.80 |

*Table 2*: Parameter estimates from logistic regression model

Model 1: Overall Risk

| *Parameter* | *Estimate* | *Standard Error* | *p-value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *Overall Risk* | 4.3880\* | 1.4512 | 0.0026 | 1.5356 | 7.2405 |
| *Gender* | -0.2815 | 0.3588 | 0.4331 | -0.9868 | 0.4237 |
| *Age* | 0.3078\* | 0.1467 | 0.0365 | 0.01946 | 0.5960 |

Model 2: Internal Risk

| *Parameter* | *Estimate* | *Standard Error* | *p-value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *Internal Risk* | 2.9205\* | 0.9005 | 0.0013 | 1.1504 | 4.6906 |
| *Gender* | -0.3065 | 0.3564 | 0.3903 | -1.0071 | 0.3941 |
| *Age* | 0.2796 | 0.1475 | 0.0586 | -0.01025 | 0.5695 |

Model 3: External Risk

| *Parameter* | *Estimate* | *Standard Error* | *p-value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *External Risk* | 2.3514 | 1.3769 | 0.0884 | -0.3551 | 5.0579 |
| *Gender* | -0.2901 | 0.3531 | 0.4117 | -0.9842 | 0.4039 |
| *Age* | 0.3183\* | 0.1422 | 0.0258 | 0.03871 | 0.5978 |

*NOTE:* Gender, Male = 1 Female = 0; Parameter estimates significant alpha of 0.05 are indicated by a \*. All models additionally controlled for: Household income, mentee ethnicity, semester of attendance, day of week of attendance, and room of attendance.

*Table 3:* Parameter estimates from Poisson regression models on attendance.

Model 4: Overall Risk

| *Parameter* | *Estimate* | *Standard Error* | *P-value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *Overall Risk* | -0.4509\* | 0.1483 | 0.0024 | -0.7415 | -0.1603 |
| *Gender* | 0.0268 | 0.0332 | 0.4201 | -0.0383 | 0.0919 |
| *Age* | -0.0331\* | 0.0107 | 0.0020 | -0.0541 | -0.0121 |

Model 5: Internal Risk

| *Parameter* | *Estimate* | *Standard Error* | *P-Value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *Internal Risk* | -0.3526\* | 0.0980 | 0.0003 | -0.5447 | -0.1604 |
| *Gender* | 0.0307 | 0.0333 | 0.3569 | -0.0346 | 0.0959 |
| *Age* | -0.0287\* | 0.0108 | 0.0080 | -0.0500 | -0.0075 |

Model 6: External Risk

| *Parameter* | *Estimate* | *Standard Error* | *P-Value* | *95% CI* | |
| --- | --- | --- | --- | --- | --- |
| *External Risk* | -0.1917 | 0.1330 | 0.1494 | -0.4523 | 0.0689 |
| *Gender* | 0.0240 | 0.0332 | 0.4697 | -0.0410 | 0.0890 |
| *Age* | -0.0364\* | 0.0107 | 0.0007 | -0.0573 | -0.0154 |

*NOTE: Gender, Male = 1 Female = 0; Parameter Estimates considered significant at alpha of 0.05 indicated by a \*. All models additionally controlled for: Household income, mentee ethnicity, semester of attendance, day of week of attendance, and room of attendance.*